**Commonwealth of Kentucky**
**Division for Air Quality**

# PERMIT STATEMENT OF BASIS

TITLE V DRAFT PERMIT No. V-03-015
ARKEMA INC.
CALVERT CITY, KENTUCKY 42029
February 24, 2006
CAROLINA ALONSO, REVIEWER
SOURCE I.D. #: 21-157-00007
SOURCE A.I. #: 2918
ACTIVITY I.D. #: APE20040007

**SOURCE DESCRIPTION:**

Arkema Inc. (Arkema), Calvert City, is a specialty chemical manufacturing plant. The source is a major source, as defined by 401 KAR 52:020 Title V Permits, for the potential emissions of over 100 tons per year of particulate matter less than ten microns ($PM_{10}$), sulfur dioxide ($SO_2$), nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOC), the potential of a single hazardous air pollutant (HAP) greater than 10 tons per year, and the potential combined HAP emissions greater than 25 tons per year.

The source is also a major source, as defined by 401 KAR 51:017 Prevention of Significant Deterioration of Air Quality (PSD), for potential emissions of over 100 tons per year of particulate matter (PM), $SO_2$, NOx, CO, and VOC. The following table lists its applications and permits that have been issued since its Title V permit application was deemed complete in February 13, 1999, and the applications that will be initially permitted in this Title V permit V-03-015.

| Application Date | Permit (Issuance Date) | Description |
|---|---|---|
| 11/04/1999 | F-00-030 (4/3/2001) | Remediation operations |
| 10/10/2002 | V-03-015 (TBD) | TV application update |
| 05/03/2000 | F-00-021 (9/27/2000) | Phase II F-134a plant expansion |
| 12/18/2001 | F-00-021 R1 (3/18/2002) | Refrigerant transload and blend |
| 07/03/2002 | VF-02-004 (2/13/2003) | Refrigerant packaging modification |
| 06/13/2003 | VF-02-004 R1 (1/20/2004) | Recommissioning packaging area |
| 08/31/2004 | VF-05-002 (9/16/2005) | F-32 Plant construction |
| 12/15/2004 | VF-05-001 (7/8/2005) | K-98 Plant expansion |
| 04/20/2005 | V-03-015 (TBD) | Packaging Area sig. Rev. |
| 10/25/2005 | V-03-015 (TBD) | Powder line addition |
| 11/14/2005 | V-03-015 (TBD) | Incorporation of alternate thickener |

The Title V permit incorporates the conditions of previous permits and information in application received after the Title V application.

Arkema produces Kynar Monomer, Kynar Polymer, F-141b, F-142 b, and F-134a. Arkema also produces hydrogen chloride (HCl) as a by-product. The pending Title V application was submitted in December 1998, and an updated Title V permit application, log number 50710, was submitted on October 10, 2002.

For the purpose of Title V permitting, this facility is split into different areas. The areas are as follows:

1. Boiler area
2. Monomer plant
3. Polymer plant
4. K-97 plant/F-140s Process
5. K-98 plant
6. F-134a plant
7. K-97 plant/F-32 process
8. Logistics, Packaging, and Loading
9. Hazardous waste incinerator
10. Remediation

**1. Boiler Area:**

Arkema operates four boilers used primarily for process heat. Boilers number 1 and 2 have heat input capacity of 60 mmBtu/hr each. Boilers number 3 and 4 have heat input capacity of 94.3 and 82.9 mmBtu/hr respectively. The boilers use natural gas as primary fuel and can use number 2 fuel oil as secondary fuel.

Boilers number 1, 2, and 3 (EP 90, 91, and 94 respectively) are subject to particulate matter mass emission, sulfur dioxide emission, and opacity limits pursuant to 401 KAR 61:015. Number 2 fuel oil shall not be burned in excess of one million gallons in Boiler number 4 to preclude the applicability of 401 KAR 51:017, PSD. Boiler number 4 (EP Q4) is subject to particulate matter mass emission, sulfur dioxide emission, and opacity limits pursuant to 401 KAR 59:015 and 40 CFR 60 Subpart Dc. The particulate and sulfur dioxide emissions limits in the 401 KAR 59:015 and 401 KAR 61:015 are a function of the county and air quality control regions the indirect heat exchanger is located in, and the total rated heat input capacity of all indirect heat exchangers at the source that were in existence or permitted at the time the indirect heat exchanger in question was permitted, inclusive of the indirect heat exchanger permitted. Fuel monitoring is not required for indirect heat exchangers less than 250 mmBtu/hr heat input capacity. The four boilers follow under the existing, large, liquid fuel subcategory of 40 CFR 63 Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters, and subject only to the initial notification requirements of 40 CFR 63 Subpart A.

**2. Monomer plant:**

Monomer plant produces Kynar monomer (Vinylidene Fluoride, $VF_2$) by pyrolytic dechlorination of F-142b. Chlorine ($Cl_2$) gas may be used as a catalyst, Monomer and HCl are formed by cracking F-142b in presence of $Cl_2$ in a pyrolysis furnace. Acidic impurities are removed by an acid absorber and series of caustic scrubbers. The resulting crude monomer is dried in a molecular sieve tank prior to further refining. The dried crude monomer is purified with a series of distillation columns. Light organic impurities are vented to a thermal oxidizer, hazardous waste incinerator, or directly to atmosphere within the limits specified in section 2.3. F-142b is recycled back to the F-142b storage tank, and the heavy organics are destroyed in the hazardous waste incinerator, or disposed off-site.

2.1 Monomer Cracking Furnace and Process Heater

F-142b is fed to the furnace, where the F-142b molecule is cracked to form monomer and HCl. $Cl_2$ catalyst can be used in the cracking process. The process materials are fully enclosed within the furnace, and are not emitted to the atmosphere. A natural gas fired process heater (EP 45) supplies process heat. Emissions from the furnace and heater are due to natural gas combustion only.

2.2 Molecular Sieve Dryers and Dryer Regeneration Heater

Crude monomer passes through one of two molecular sieve dryers (EP 33) where moisture is removed. The process materials are fully enclosed within the dryer and are not emitted to the atmosphere during normal operation. Emissions occur during dryer regeneration only. The dryers are regenerated one at a time, with each regeneration taking approximately 24 hours. Therefore, total dryer regenerations are approximately 365 per year. Regeneration begins with a vacuum pump evacuating the dryer headspace. The pump discharge is returned to the monomer process. The organics remaining on the sieve material and in the dryer headspace are then driven off and emitted to the atmosphere within a limit specified below. A natural-gas fired heater (EP 45) heats a closed heat exchange system. Nitrogen is used as the heat transfer medium. The heated nitrogen is used to drive off residual organics.

The molecular sieve material is sampled for organics before and after regeneration. This test data is used to estimate the amount of material driven off the sieves during regeneration. Engineering calculations are used to estimate the amount of organics remaining in the dryer space after the vacuum is drawn. Organics in the regeneration stream are primarily $VF_2$ (VOC) and F-142b (ODS). Total emissions are the sum of VOC and ODS present in the vapor space and from sieve desorption. Emissions from the heater are due to natural gas combustion. AP-42 emission factors for natural gas combustion in small combustion units (<100 mmBtu/hr) are used to calculate emissions.

The permittee has taken a VOC limit of 4 tons during any consecutive 12-month period to preclude the applicability of 401 KAR 51:017, PSD. The regeneration heater for the molecular sieve dryer is subjected to 401 KAR 61:015, Existing indirect heat exchangers constructed prior to April 9, 1972. The permittee shall comply with particulate matter and sulfur dioxide mass emission limits pursuant to 401 KAR 61:015 Section 4 and 5. As specified in 401 KAR 61:015, Sections 6(4) and (5), fuel monitoring is not required for indirect heat exchangers less than 250 mmBtu/hr heat input capacity. The regeneration heater follows under the existing, small, gaseous fuel subcategory of 40 CFR 63 Subpart DDDDD.

2.3 Distillation Columns

Dried crude monomer is purified with a series of four distillation columns. The air column (EP 34) removes air and non-condensable materials. Air column overheads are vented to the thermal oxidizer, hazardous waste incinerator, or directly to the atmosphere with the limits specified below. The monomer column separates monomer from unreacted F-142b and other organic impurities. The monomer column does not vent to the atmosphere. Monomer product leaves the monomer column in the overhead reflux line and is condensed and pumped to product tanks. The monomer column bottoms are distilled in the lights column (EP 35). Light organic impurities are vented to the thermal oxidizer, hazardous waste incinerator, or emitted to the atmosphere within the limits specified below. The lights column bottoms go to the recycle column, which separates F-142b from heavy organics. F-142b is recycled back to F-142b storage tank, and heavy organics are destroyed in the hazardous waste incinerator or disposed of off-site. The recycle column does not vent to the atmosphere.

Since the monomer air and monomer lights columns may vent to thermal oxidizer, hazardous waste incinerator, or directly to atmosphere, the emissions are included in the total flows used to calculate emissions from those emission points. Stack tests were performed to measure emissions to the atmosphere; the results from these tests were evaluated to determine a typical maximum hourly VOC emission rate. Potential unlimited annual emissions were calculated for continuous operation.

The source has elected to accept the following limits in order to preclude the applicability of 401 KAR 51:017, PSD for VOC and ODS. The total VOC emissions from the monomer air column (EP 34) and monomer lights column (EP 35) shall not exceed 40 tons in any consecutive 12-month period. ODS emissions from the monomer lights column (EP 35) shall not exceed 12 tons in any consecutive 12-month period. Consent Decree 01-7087 between United States of America and Atofina Chemicals, Inc (Arkema) requires that all point source VOC emissions from the monomer air column vent (EP 34) and monomer lights column vent (EP 35) are captured and a minimum destruction efficiency of 95% for the captured emissions is achieved. The existing thermal oxidizer (EP Q5) and hazardous waste incinerator (EP A6) are used for such control. Fugitive emissions are not included in the capture requirement. 40 CFR 60 Subpart NNN, Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations, does not apply since the air and lights column does not produce any of the chemicals listed in 40 CFR 60.667 as a product, co-product, by-product, or intermediate.

The Kynar Monomer Air and Lights Columns (EP 34 and 35 respectively) had annual performance test requirements. In addition, although not required, there were mass flow meter and gas chromatograph (GC) in place to measure emissions from each column. Annual performance tests provided only instantaneous emissions measurements. In contrast, the mass flow meter and GC provided continuous data of actual emissions. Therefore, the annual testing requirement is modified to a continuous monitoring requirement for EP 34 and EP 35. These changes have no associated emissions changes.

2.4 <u>Monomer Plant Fugitive Emissions</u>

The source has elected to accept annual limits in order to preclude the applicability of 401 KAR 51:017, PSD for VOC. The fugitive emissions from the Kynar Monomer Plant Process Equipment (EP 63) shall not exceed fifteen and one-half (15.5) tons per year of volatile organic compounds (VOCs) in any consecutive 12-month period. Fugitive emissions are calculated using emission factors developed from the results of a VOC screening survey at the Forane plants. 40 CFR 60 Subpart VV, Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry, does not apply since the process units in the monomer area do not produce an intermediate or final product chemical listed in 40 CFR 60.489.

2.5 <u>Comments</u>

The Monomer Plant is an existing miscellaneous organic chemical manufacturing process unit (MCPU) as defined in 40 CFR 63 Subpart FFFF. The Monomer Plant shall comply with the applicable provisions of 40 CFR 63 Subpart FFFF (National Emission Standards for Hazardous Air

Pollutants: Miscellaneous Organic Chemical Manufacturing) no later than the compliance date specified in Subpart FFFF, as updated. The specific emission points and specific process units, which are subject to 40 CFR 63 Subpart FFFF requirements, shall be defined and submitted to the Division in accordance with 40 CFR 63.2520 (d)(1) within 150 days after the compliance date of May 10, 2008 (40 CFR 63.2445 (b)).

**3. <u>Polymer plant:</u>**

Kynar polymer (polyvinylidene fluoride) is produced through a batch reaction process. The main reactant is $VF_2$ monomer (vinylidene fluoride). Other minor additives are also used, depending on the polymer grade produced. The $VF_2$ monomer is obtained from the aforementioned monomer plant, or from outside sources. Raw materials are fed to the polymer reactors. The reaction process produces a polymer latex solution (polymer and water). The solution can be sold as a final product, or dried and processed on site.

Polymer latex solution is washed and processed, then dried and transferred through a pneumatic material handling system (MTS) to one of several finishing process paths. The process paths are used to produce polymer powder or pellets for shipment. Dry polymer powder can also be brought to the plant from off-site, and extruded to produce polymer pellets.

The polymer plant can further be divided into several areas.

- Ancillary and feed
- Reaction
- Latex solution processing
- Drying
- Finishing / packaging

Categories of polymer particulate emission sources are developed based on the type of material processed (latex slurry, milled powder, etc.) and method of processing (process collector, drop transfer, etc.). The emission sources tested during particulate testing were assigned to the appropriate categories, and emission factors derived for the categories tested. For categories not tested, engineering calculations are used to derive estimated emission factors. The maximum particulate emissions from each process path are calculated using the theoretical path capacity, uncontrolled emission factor, and controlled emission factor. The annual throughput for the wet latex slurry processing particulate matter (PM) is based on the upstream reactor capacities. All other process path annual throughputs are calculated using the hourly capacity at 8760 hr/yr. All the process paths cannot emit at their highest annual rates simultaneously due to the inherent process limitations. The potential particulate emissions are calculated using a worst-case scenario approach. The dry polymer process path with the highest uncontrolled emission factor processes its theoretical annual capacity. The polymer process path with the second highest uncontrolled emission factor processes the remainder of the 18.5 million lbs/yr dry polymer produced by the dryers. The worst case uncontrolled particulate emissions is the sum of these two emission rates. The same approach is used for controlled emissions. Also, dried polymer may be brought from off-site and processed through one of the extruder process paths. Therefore, each extruder is assumed to be operating at its maximum capacity and this additional polymer is included in the analysis.

3.1 <u>Ancillary and Feed</u>

This area includes raw material storage and handling. Equipment in this area qualifies as insignificant activities, and is listed on application form DEP7007DD.

3.2 Reaction

There are four polymer reactors (EP 58). Raw materials (water, $VF_2$ monomer, additives, initiators, and chain transfer agents) are fed to the reactor on a batch basis. Once the reaction is complete, the reactors are vented through knockout pots to either the gasholder (EP 47) or the monomer gas recovery vessel (EP AE). The monomer gas recovery vessel (EP AE) vapors are either transferred to the monomer plant for reuse, or transferred to the gasholder (EP 47). The gasholder vapors are sent to either the F-134a thermal oxidizer or the hazardous waste incinerator for destruction. Emissions from reactor venting to the gasholder or monomer gas recovery vessel are accounted for in the emission inventory under the F-134a thermal oxidizer (EP Q5) or the hazardous waste incinerator (EP A6).

Permit F-98-023 (Revision) issued on January 12, 2000 authorized the increase of trichlorofluoromethane (F-11) usage from 100,000 lb/yr to 200,000 lb/yr. In anticipation of the need for additional ODS reductions to offset future emissions increases, Arkema proposed the increased F-11 usage to be 125,000 instead of originally permitted 200,000 lb/yr. It is possible to retroactively reduce the limit to this level since the proposed reduced limit was never exceeded. This changed limit is practically made enforceable through this Title V permit. The following table shows the emissions changes resulting from the originally permitted 200,000 lb/yr limit and the proposed retroactive 125,000 lb/yr limit.

| Operation | Basis of future potential emissions | Past actual emissions (ton/yr) | Future potential (ton/yr) | ODS emissions change (ton/yr) |
|---|---|---|---|---|
| Polymer latex process emissions due to increase to F-11 usage limit | 200,000 lb/yr limit | 37.69 | 75.38 | 37.69 |
| | 125,000 lb/yr limit | 37.69 | 47.11 | 9.42 |

The source has elected to accept the following limits in order to preclude the applicability of 401 KAR 51:017, PSD for ODS. Prior to transferring a batch from the polymer reactors (EP 58), the reactors are vented either to the polymer gasholder (EP 47) or monomer gas recovery vessel (EP AE), and the calendar month average pressure, prior to transfer, in the polymer reactors (EP 58) shall be below 15 pounds per square inch gauge (psig). Total combined annual input of F-11 to the reactors shall not exceed 125,000 pounds for any consecutive 12-month period. 40 CFR 60, Subpart RRR, Standards of Performance for VOC Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes does not apply to the polymer reactors since they do not produce any chemical listed in 40 CFR 60.707 as a product, co-product, by-product, or intermediate.

3.3 Latex Solution Processing

The polymer latex solution produced in the reaction process can be pumped from the reactors to latex storage and then loaded to drums or tank trucks for sale without further processing. If the latex solution is processed on site, the solution is pumped from the reactors to the latex screeners, where oversized material is filtered out. From the screeners, the latex is collected in a latex pump tank, and pumped to the latex check tanks. From the check tanks, the latex is transferred to the coagulator feed tanks. The latex is then sent to coagulators, wash columns, and thickeners. Coagulated polymer is removed from the thickener and pumped to the dryers. Process wastewaters, including reactor wash water, are sent to the polymer trap. The wastewater and polymer are separated, with the wastewater sent to the on-site treatment plant and the polymer residue disposed of as a waste. Particulate emissions from latex solution processing are insignificant. Organic emissions are accounted for in the emission inventory under the polymer plant latex processing organic emissions (EP GR1) (see discussion of organic emissions in section 3.6).

3.4 Drying

From the thickeners, latex solution is pumped to one of three dryers (two spray dryers and one rotary dryer) (EP 38, E8, and 41 respectively). The dried powder is collected in the dryer's process collector, and introduced into the pneumatic material transfer system (MTS). Particulate emissions from the dryers are accounted for in the emission inventory at the dryer emission points. Organic emissions are accounted for in the emission inventory under the polymer plant latex processing organic emissions (EP GR1) (see discussion of organic emissions in section 3.6).

The two spray dryers are subject to particulate matter mass emission and opacity limits pursuant to 401 KAR 59:010. The rotary dryer is subject to similar limits pursuant to 401 KAR 61:020.

3.5 Finishing / Packaging

The material transfer system (MTS) is used to transfer material to and between the dry polymer finishing systems. The MTS gives the area considerable flexibility by allowing polymer to be transferred to virtually any finishing process system. Dried polymer proceeds through one of six existing and one new finishing/packaging process paths, designated as A through G. These paths are:

- W&P extrusion (EP PLA)
- Berstorff extrusion (EP PLB)
- Milled polymer (EP PLC)
- Unmilled polymer (EP PLD)
- Tote bins (EP PLE)
- Bulk bags (EP PLF)
- Milled polymer (new) (EP PLG)

Each process path consists of a core group of equipment that is not shared among process paths, but each path also includes equipment that is common to other process paths. Therefore, all process paths cannot operate simultaneously. These multiple process paths require that potential annual particulate emissions be determined in terms of annual polymer plant capacity, rather than the sum of individual short-term process path or equipment capacities. Particulate emission factors have been developed for each path, along with the maximum hourly processing capacity. The maximum hourly capacity of each path is determined by the piece of equipment with the lowest hourly throughput. The maximum annual capacity is 18.5 million pounds of dry polymer per year. In addition to the 18.5 million pounds of polymer produced on-site, dry polymer powder can also be brought to the plant from off-site and processed through paths A and B (EP PLA and PLB) to produce polymer pellets.

Particulate emissions from the seven finishing/packaging process paths are accounted for in the emission inventory at the process path emission points. Organic emissions are accounted for in the emission inventory under the polymer plant latex processing organic emissions (EP GR1) (see discussion of organic emissions in section 3.6).

The individual process units in each of the above listed path are subject to particulate matter mass emission and opacity limits pursuant to 401 KAR 59:010. The permittee is required perform weekly visual observations of the control device or stack and keep the records for these observations.

3.6 Organic Emissions

Organic emissions from the polymer plant can be divided into two virtual emission points, the fugitive equipment leaks (EP AH), and the latex processing organics (EP GR1). Fugitive leaks (EP AH) are calculated using estimated component counts and site-specific emission factors. Latex processing organics (EP GR1) (including wastewater emissions) are calculated using emission factors derived from performance tests required by permit F-98-023. The emission points whose organic emissions are included in the factors derived from the performance tests are listed under emission point GR1 on application form DEP7007B.

The source has elected to accept the following limits in order to preclude the applicability of 401 KAR 51:017, PSD for VOC, and ODS. VOC and ODS emissions shall not exceed 120 and 75.4 tons in any consecutive 12-month period, respectively. The contemporaneous VOC emissions change permitted by F-98-023 was –64 ton/yr (104 tons/yr less than the allowed 40 tons/yr VOC increase that would have triggered PSD). Therefore, the permitted contemporaneous VOC emissions change did not trigger PSD. Furthermore, actual VOC emissions from polymer latex processing (GR1) are significantly less than the permit limit (120 tons/yr). In light of the large margin of compliance, the annual sampling requirement is changed to once per permit term requirement. Performance tests shall be conducted once during the permit term for EP GR1. These performance tests shall also be conducted for new products within 180 days after initiating production of a new product or using a new raw material, where the new product or raw material is expected to result in emissions of VOC or ODS.

3.7 Polymer Plant Fugitive Emissions

The source has elected to accept annual limits in order to preclude the applicability of 401 KAR 51:017, PSD for VOC. The fugitive emissions from the polymer plant process equipment (EP AH) shall not exceed 39 tons per year of VOC in any consecutive 12-month period. 40 CFR 60 Subpart VV, Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry, does not apply since the process units in the polymer area does not produce an intermediate or final product chemical listed in 40 CFR 60.489.

**4. K-97 Plant/F-140s Process and K-98 Plant:**

The K-97 plant/F-140s process and the K-98 plant are capable of producing F-141b and F142b. The plants have the ability to produce F-141b and F-142b at a wide range of percentages.

The process consists of the following process areas for each plant:

- Reaction area
- Product separation area

- HCl absorption area
- Purification area (K-98 plant only).

4.1 Reaction Area

In each reaction area hydrogen fluoride (HF) and methyl chloroform are fed to a reactor, where the HF and methyl chloroform react to form F-141b and HCl. The F-141b then reacts with HF to form F-142b and HCl. A small quantity of the F-142b goes on to react with HF to form F-143a and HCl. The percentage of F-141b and F-142b exiting the reactor can be controlled by varying the reactor conditions. The reactors also produce several other organic materials which must be treated as a hazardous waste. In order to minimize the quantity of hazardous waste produced, the plant operates a HF recovery system for each reactor. The reactor draw goes to a phase separator where the organics separate from the HF, which is then returned to the reactor. The organics and remaining HF are sent to the hazardous waste storage tanks. This material is treated on site in the hazardous waste incinerator (EP A6) or may be shipped offsite for treatment. Consent Decree 01-7087 between United States of America and Atofina Chemicals, Inc (Arkema) requires that all point source ODS emissions from the K-98 AHF azeo column (EP A5) shall be captured and a minimum destruction efficiency of 95% shall be achieved for the captured emissions. Fugitive emissions are not included in the capture requirement. The mentioned Consent Decree also requires that K-98 Lights column (EP B6) shall not be vented through the K-98 drowning tower more than 72 hours per month.

K-97 and K-98 AHF azeo columns (EP A13 and A5 respectively) and K-97 and K-98 lights columns (EP A15 and B6 respectively) are not subject to 40 CFR 60 Subpart NNN since these process units do not produce as a product, co-product, by-product, or intermediate a chemical listed in 40 CFR 60.667. Emissions from the K-97 azeo column (EP A13) are a function of how the process is operated, and do not correlate directly with production rates. Actual emissions are calculated from the 1998 SARA report and are based on records of valve position and engineering calculations of vent stream composition. The K-97 lights column (EP A15) is normally vented back to the HCl column, the hazardous waste incinerator, or the K-97 drowning tower.

4.2 Product Separation Areas

In each product separation area HCl is separated from the organic components of the stream by distillation. The anhydrous HCl and some F-143a is sent to the HCl absorption areas to produce 36% HCl. Additional distillation columns in each separation area separate recyclable materials. These include methyl chloroform, which is sent back to the reactors, crude F-141b which is sent to the purification area, and F-142b product which is sent to product day tanks. The F-142b is then transferred from the day tanks to larger storage vessels.

4.3 HCl Absorption Areas

Anhydrous HCl and some F-143a from the separation areas is directed to HCl absorbers (EP 80 and A7). In the absorbers, the HCl is absorbed into water to produce a 36% HCl solution. Vent emissions are based on a 99.9% absorber/tails tower recovery efficiency. Emissions are assumed to be 99.99% HCl with the remaining 0.01% being HF. Emissions are controlled by a scrubber with a 99% removal efficiency for HCl and HF. The 36% HCl flows into HCl shift tanks. Any HCl which passes through the absorbers is removed in the tails towers.

To preclude the applicability of 401 KAR 51:017, PSD for ODS, K-98 acid stripper (EP M8) venting to the drowning tower shall not exceed 1,614 hours in any consecutive 12-month period.

4.4 F-141b Purification

Crude F-141b is purified in the F-141b Purification Area. Purified F-141b is sent to F-141b day tanks. From the day tanks the F-141b is transferred to other F-141b tanks to await shipment.

4.5 Comments

Permit VF-05-001 authorized an expansion to the K-98 plant. The expanded K-98 plant emits criteria pollutants, hazardous air pollutants (HAP), and ozone depleting substances (ODS), the project's emissions changes were less than the corresponding PSD/NSR significant levels, so no netting was required. Thus, 401 KAR 51:017, PSD is not applicable for this project.

For both K-97 Plant/F-140 Process and K-98 Plant, methyl chloroform raw material usage shall not exceed 14 million gallons in any consecutive 12-month period (in order to preclude the applicability of 401 KAR 51:017 PSD for ODS). Records shall be kept of the amount of methyl chloroform raw material used each month and total methyl chloroform raw material used for the previous 12-month period. The K-97 methyl chloroform feed tank is not subject to 40 CFR 60 Subpart Kb because liquid stored (methyl chloroform) is not a volatile organic liquid as defined in 40 CFR 60.111b. The fugitive emissions from the K-97/F-140s process and K-98 plant are not subject to 40 CFR 60 Subpart VV because no process unit produces as an intermediate or final product a chemical listed in 40 CFR 60.489. The existing K-97 Plant/F-140s process shall comply with the applicable provisions of 40 CFR 63 Subpart NNNNN (Hydrochloric Acid Production NESHAP) no later than the compliance date specified in Subpart NNNNN, as updated. The compliance date is currently scheduled as April 17, 2006 per 40 CFR 63.8995(b), but may be updated by U.S. EPA. The specific emission points and specific process units, which are subject to 40 CFR 63 Subpart NNNNN requirements, shall be defined and submitted to the Division.

**5. F-134a Plant:**

The F-134a plant is used to produce refrigerant 134a, an HFC which is an environmentally friendly substitute for CFCs. F-134a has no ozone depleting potential. It is not classified as an ODS, and is not a VOC. The F-134a plant consists of six main areas:

- Raw Materials Feed
- Liquid Phase (First Stage) Reaction Area
- Gas Phase (Second Stage) Reaction Area
- Washing / Drying / Compression
- Distillation
- HCl Absorption

In the raw materials feed area, raw materials including trichloroethylene (TCE), HF, and $Cl_2$ are received and stored. In the liquid phase reaction area, TCE and HF are reacted to produce F-133a and HCl. In the gas phase reaction area, the F-133a is reacted with HF to produce F-134a and HCl. The crude F-134a stream is then purified with a series of distillation columns. F-134a is sent to storage prior to loadout and shipment. HCl from each reaction area is sent to its respective HCl absorption to produce 36% HCl. The HCl co-product is sent to storage tanks prior to loadout. Certain gas streams from the F-134a Process Unit are vented to the F-134a thermal oxidizer (EP Q5). Several liquid waste streams from the process are sent to the waste organic tank, and then to the on-site hazardous waste incinerator (EP A6). F-134a process unit wastewaters are handled in existing wastewater treatment equipment.

The $Cl_2$ storage tanks are not normally vented. However, during unloading in the summer months it is sometimes necessary to depressurize the tanks to allow $Cl_2$ to be unloaded. $Cl_2$ is unloaded approximately every 60 days. The emissions are piped to the F-134a vent scrubber for control. In the liquid (first) stage HCl recovery area HCl is absorbed in the HCl absorber and tails tower. The HCl shift tanks emissions are vented back to the HCl recovery section. The gas (second) phase HCl absorber/tails tower is normally vented to the F-134a thermal oxidizer. Emissions from the thermal oxidizer is based on the maximum feed rate and worst-case feed stream compositions. The worst-case organic content is assumed to be 100%. The worst-case HF, HCl, and $Cl_2$ emissions are based on emission ratios. This is a more relevant measure of potential emissions for these pollutants than the percent in feed because these pollutants are formed during the combustion process. Worst-case CO emissions are based on the gas-phase absorber tails/tower stream composition. The waste acid clearing system and alternate evacuation system is vented to either the F-134a thermal oxidizer or the F-134a vent scrubber. Emissions from venting to the thermal oxidizer are calculated at that emissions unit that uses typical maximum quantities cleared, and assumes that everything is vented to the scrubber. Emissions from the heaters are due to natural gas combustion. AP-42 emission factors for natural gas combustion in small combustion units (<100 mmBtu/hr) are used to calculate emissions.

40 CFR 60 Subpart Kb is not applicable to $Cl_2$ receiving and storage since $Cl_2$ is not a volatile organic liquid. 40 CFR 60 Subpart NNN is not applicable to liquid and gas phase HCl absorption and tails tower, lights column, and F-124 purge column because these process units do not produce as a product, co-product, by-product, or intermediate any chemical listed in 40 CFR 60.667. Primary and secondary gas phase reactor superheaters are exempt from 40 CFR 60 Subpart Dc because the rated capacity of each superheater is less than 10 mmBtu/hr. F-134a plant fugitive emissions are exempt from 40 CFR 60 Subpart VV because no process unit produces any chemical listed in 40 CFR 60.489 as an intermediate or final product.

5.1 Comments

In order to preclude applicability of 401 KAR 51:017, PSD; permit F-00-021 established the following limits for most of the equipment in the F-134a:

| **Pollutant** | **Allowable area-wide emission limit** |
|---|---|
| CO | 90 tpy |
| $PM_{10}$ | 13.5 tpy |
| $SO_2$ | 36 tpy |
| NOx | 36 tpy |
| VOC | 36 tpy |

Permit F-00-030, issued on April 23, 2001 authorized the construction and operation of soil and groundwater remediation systems, to be controlled by new vapor treatment system (package thermal oxidizer and scrubber). Because the change resulted in increased ODS emissions, a contemporaneous netting analysis was performed. Following this permit issuance, the permittee determined that it would be more desirable to route vapors from the remediation operations to the existing F-134a thermal oxidizer (EP Q5), instead of installing a new package thermal oxidizer. This feed rate increase was permitted by permit F-00-021 (Revision 1) issued on March 18, 2002. This revision increased the thermal oxidizer feed rate limit from 3,460 lb/hr to 6,500 lb/hr. The increase resulted in a 2.56 ton/yr increase in ODS emissions, which was included in the contemporaneous ODS netting analysis. Because the remediation operations are now supposed to be vented to the existing F-134a thermal oxidizer (EP Q5), the ODS emissions due to the remediation operations was included in the 2.56 ton/yr increase. Therefore, the 0.88 ton/yr ODS emission increase from the vapor treatment system stack included in the netting for F-00-030 was essentially counted twice in the netting for F-00-021 (Revision 1). To avoid this double counting, the 0.88 ton/yr increase is now removed from the contemporaneous netting table. The 0.01 ton/yr increase due to new fugitives permitted in F-00-030 remains in the netting, because these fugitives are not included in the subsequent thermal oxidizer feed rate limit permit revision. See Section 9. Remediation.

The F-134a Plant is an existing miscellaneous organic chemical manufacturing process unit (MCPU) as defined in 40 CFR 63 Subpart FFFF (National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing). The F-134a Plant shall comply with the applicable provisions of 40 CFR 63 Subpart FFFF no later than the compliance date specified in Subpart FFFF, as updated. The specific emission points and specific process units, which are subject to 40 CFR 63 Subpart FFFF requirements, shall be defined and submitted to the Division in accordance with 40 CFR 63.2520 (d)(1) within 150 days after the compliance date of May 10, 2008 (40 CFR 63.2445 (b)).

The existing F-134a Liquid Phase and F-134a Gas Phase HCl Production Facilities shall comply with the applicable provisions of 40 CFR 63 Subpart NNNNN (Hydrochloric Acid Production NESHAP) no later than the compliance date specified in Subpart NNNNN, as updated. The compliance date is currently scheduled as April 17, 2006 per 40 CFR 63.8995(b), but may be updated by U.S. EPA. The specific emission points and specific process units, which are subject to 40 CFR 63 Subpart NNNNN requirements, shall be defined and submitted to the Division in accordance with 40 CFR 63.9 (h) within 60 days following the relevant compliance demonstration activity due within 180 days (40 CFR 63.7) of the compliance date of April17, 2006 (40 CFR 63.8995 (b)).

**6. <u>K-97 Plant / F-32 Process</u>:**

Synthetic Minor Permit VF-05-002 has was issued for construction of F-32/HCl plant, which also includes installation of a new boiler.

The unit will produce refrigerant F-32 (difluoromethane, CAS 75-10-5), an ozone-friendly substitute for chlorofluorocarbons and hydrochlorofluorocarbons, and food grade hydrochloric acid. Several upstream and downstream facilities may also be added or modified as part of the project. The new F-32/HCl production unit will involve the following main processes:

- Raw materials feed
- Reaction
- Purification
- HCl recovery
- Product handling

The new F-32/HCl plant and boiler will emit criteria pollutants, HAPs, and ODS. Emissions will also occur as a result of increased upstream raw material unloading and storage, and downstream co-product storage and loading. In order to to preclude the applicability of Regulation 401 KAR 51:017, PSD, the K-97 Plant/F-140s Process shall cease operation before startup of the new F-32 Plant.

6.1 Comments

The F-32 Plant will be subject to the existing miscellaneous organic chemical manufacturing process unit (MCPU) provisions of 40 CFR 63 Subpart FFFF (National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing). The F-32 Plant shall comply with the applicable provisions of 40 CFR 63 Subpart FFFF no later than the compliance date specified in Subpart FFFF, as updated. The specific emission points and specific process units, which are subject to 40 CFR 63 Subpart FFFF requirements, shall be defined and submitted to the Division in accordance with 40 CFR 63.9 (h) within 60 days following the relevant compliance demonstration activity due within 180 days (40 CFR 63.7) of the compliance date of May 10, 2008 (40 CFR 63.2445 (b)).

The HCl recovery operations in the F-32 Plant will be subject to the existing source provisions of 40 CFR 63 Subpart NNNNN (Hydrochloric Acid Production NESHAP). The F-32 Plant shall comply with the applicable provisions of 40 CFR 63 Subpart NNNNN no later than the compliance date specified in Subpart NNNNN, as updated. The compliance date is currently scheduled as April 17, 2006 per 40 CFR 63.8995(b), but may be updated by U.S. EPA. The specific emission points and specific process units, which are subject to 40 CFR 63 Subpart NNNNN requirements, shall be defined and submitted to the Division in accordance with 40 CFR 63.9 (h) within 60 days following the relevant compliance demonstration activity due within 180 days (40 CFR 63.7) of the compliance date of April17, 2006 (40 CFR 63.8995 (b)).

## 7. Logistics, Packaging and Loading:

7.1 Logistics Operations

Logistics serves the entire Calvert City plant, with equipment at multiple locations, and includes the following activities:

- Raw material receiving and storage
- Product storage
- Bulk loading (railcars, tank trucks, ISOs)
- General plant support facilities (emergency generators, fuel tanks, etc.)

The exceptions to the above are:

- TCE receiving and storage (included in the F-134a section)
- $Cl_2$ receiving and storage (included in the F-134a section)
- AHF receiving and storage (included in the K-98 section)

The major logistics activities are:

7.1.1 HCl Co-Product Storage

HCl co-product is produced in the F-140s and F-134a plants. HCl is stored in six product tanks (EP 30). Four scrubbers control tank emissions, uncontrolled tank emissions were calculated using Tanks 4.0 software. Vapor pressure data from Perry's Handbook is entered into Tanks 4.0

software. The total emissions for the six tanks are calculated by totaling the uncontrolled and controlled emissions.

7.1.2 Methyl Chloroform Raw Material Storage

Methyl chloroform (1,1,1-trichloroethane) is used as a raw material in the F-140s plant. Railcars or barges receive the methyl chloroform. Emissions due to unloading consist of hose disconnecting losses, which are considered to be insignificant. The methyl chloroform is unloaded into one of two methyl chloroform storage tanks (EP B2). A refrigerated vent condenser for each tank controls emissions. Methyl chloroform from the storage tanks is sent to the F-140s day tanks for use in the production process. The methyl chloroform storage tanks have a low-pressure rating and are equipped with a refrigerated breather vent for control of emissions (working and breathing losses). Uncontrolled tank emissions are calculated using Tanks 4.0 software. The total emissions for the two tanks are calculated by totaling the uncontrolled and controlled emissions.

The storage tanks are not subject to 40 CFR 60 Kb because liquid (methyl chloroform) stored is not a volatile organic liquid as defined by 40 CFR 60.111b.

7.1.3 HCl Railcar Docks

There are twelve railcar docks (EP 87) dedicated to HCl loading. One HCl loading scrubber controls emissions from railcar #1 to #4 and another scrubber controls emissions from railcar # 5 to #12. These scrubbers also controls emissions from HCl loading to tank trucks.

7.1.4 Tank Truck Docks

There are four tank truck docks (EP 88) dedicated to HCl loading. The HCl loading scrubbers controls loading emissions. This scrubber also controls emissions from HCl loading to railcars.

7.1.5 HCl Barge Dock

There is one HCl barge dock (EP 89). A separate HCl barge-loading scrubber controls loading emissions.

7.1.6 Forane / HCl Railcar Docks

There are eight railcar docks (EP A33) for loading and unloading refrigerant gases (Foranes). These docks are designated as Forane railcar docks #1 through #4 and #7 through #10. Foranes are unloaded to pressurized storage vessels. Unloading emissions consist of hose disconnecting losses, which are considered to be insignificant. There are several product recovery condensers used when loading Foranes. Use of these devices is a function of which Forane is being loaded. Forane railcar docks #1 and #2 can also load HCl. The HCl loading scrubber controls HCl loading emissions.

When loading F-141b to railcars, the vent of the railcar shall be connected to a self-contained pressure-regulating valve that is set to maintain a minimum pressure of 25 psig pursuant to Consent Decree 01-7087 between United States of America and Atofina Chemicals, Inc. Previously established BACT limits and limits to preclude applicability of 401 KAR 51:017, PSD apply to the total throughput for different refrigerants through the Forane railcar and tank truck docks. Other loading and unloading limits have been accepted by the permittee to preclude applicability of 401 KAR 51:017, PSD.

7.1.7 Forane Tank Truck Docks

There are three tank truck docks for loading and unloading refrigerant gases (EP A34). One of these docks is a scale dock. Foranes are unloaded to pressurized storage vessels. Unloading emissions consist of hose disconnecting losses, which are considered to be insignificant. There are several product recovery condensers used when loading Foranes. Use of these devices is a function of which Forane is being loaded. The Forane scale dock is used to produce refrigerant blends. Blends are produced by transferring one material to the tank truck, followed by other materials, until the desired blend is achieved.

7.2. Packaging and Loading Operations

Permit VF-02-004 authorized recommissioning refrigerant packaging facilities which had been out of use since 1995. Permit VF-02-004 (Revision 1) authorized increase in the transloading of R-22 refrigerant to tank trunks, ISO containers, and railcars to accommodate a possible increase for that operation, and the addition of several dryers. Arkema is now proposing the following changes for the Packaging and Loading area:

- Increase container evacuation limit
- Increase combined evacuation/filling emission limit
- Revise fugitive components counts to reflect updated information

Arkema is requesting that the evacuation limit is increased from 83,130 $ft^3$/yr to153,350 $ft^3$/yr because of an increase in the use of refillable containers (instead of disposable containers which do not need to be evacuated). Once the containers are evacuated, they are filled with the appropriate refrigerant.

There are only slight emissions resulting from this filling which are associated with the disconnection of filling hoses. The total ODS emission increase from the proposed changes is 19.1 ton/yr (8.0 tons/yr from the increased evacuation/filling limit and 11.1 ton/yr from fugitive emissions). ODS emissions are regulated under 401 KAR 51:017, PSD. Even though this regulation imposes a 100 ton/yr significance level of ODS, Arkema has conducted Best Available Control Technology (BACT) review for the proposed changes.

7.2.1 BACT Analysis

The following control technologies were evaluated in the BACT review for ODS:

- Vapor recovery system with condenser/cooler
- Vapor collection with carbon absorption
- Vapor destruction with thermal oxidation

Arkema proposes the use of the existing vapor recovery system as BACT for the container evacuation emissions.

The existing Logistics, Packaging, and Loading HCl Production Facilities shall comply with the applicable provisions of 40 CFR 63 Subpart NNNNN (Hydrochloric Acid Production NESHAP) no later than the compliance date specified in Subpart NNNNN, as updated. The compliance date is currently scheduled as April 17, 2006 per 40 CFR 63.8995(b), but may be updated by U.S. EPA. The specific emission points and specific process units, which are subject to 40 CFR 63 Subpart NNNNN requirements, shall be defined and submitted to the Division in accordance with 40 CFR 63.9 (h) within 60 days following the relevant compliance demonstration activity due within 180 days (40 CFR 63.7) of the compliance date of April17, 2006 (40 CFR 63.8995 (b)).

The Packaging & Loading coating process will be subject to 40 CFR 63 Subpart MMMM, National Emissions Standards for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Product as an existing source. The paint booth (EP CP), along with an electric drying oven, shot blaster and conveying system (EP 84) make up the existing coating operation. The permitee shall submit a notification of compliance status report for the Packaging and Loading coating operation addressing compliance with 40 CFR Subpart MMMM. Pursuant to 40 CFR 63.3910, the report must be submitted no later than 30 days following the end of the initial compliance period specified in the subpart, as updated.

**8. <u>Hazardous Waste Incinerator Area</u>:**

The incinerator (EP A6) burns liquid and gaseous waste streams generated from on-site production processes. These waste streams are both hazardous and non-hazardous. Natural gas is used as an auxiliary fuel. The incinerator is controlled by a distributed control system (DCS). Important process information associated with incinerator operations are logged, trended, and archived electronically by the DCS. Whenever a process parameter moves outside of its permitted range, the waste feed valves automatically close. The auxiliary fuel and waste gas retained in the system continue to burn.

The plant stores hazardous waste in five above-ground pressure vessels (L-V-0119, L-V-0119A, L-V-0121, L-V-0229, and N-V-6103). The tanks are operated under pressure with no emissions to the atmosphere. There is a facility for loading waste from these tanks into tank trucks for offsite disposal. Tank truck loading only occurs while the incinerator is operating so that the tank truck vents can be routed to the incinerator for control.

Combustion gases from the incinerator pass through a series of air pollution control devices. First they pass through a rapid water quench to lower the temperature. The gases then pass through a venturi scrubber. The venturi is considered to be the first air pollution control device for PM. After passing through the venturi scrubber, the gases go through a series of packed column (i.e. packed bed) scrubbers. The packed column provides scrubbing of HCl, HF, $F_2$, and $Cl_2$ from the combustion gas before discharging to the finishing scrubber. The finishing scrubber (final packed column scrubber) inlet water scrubbing liquid contains alkaline to regulate the pH of the scrubber liquid, which aids in halogen removal. Gases exiting the finishing scrubber discharge to the wet electrostatic precipitator (WESP), which is the final component in the incinerator air pollution control train. The WESP is designed to collect particulate matter and serve as a polishing device prior to the gases being discharged to the atmosphere.

Arkema operates the hazardous waste incinerator at the Calvert City plant in compliance with 40 CFR 63, EEE, also referred to as the Hazardous Waste Combustor MACT rule. The permittee prepared the required Startup, Shutdown, and Malfunction Plan (SSMP), Operating and Maintenance Plan (OMP), Continuous Monitoring System Performance Evaluation Plan (CMS PEP), and Feedstream Analysis Plan (FAP). The SSMP (40 CFR 63.1206 (c) (2)) defines the plan and procedures for operating the incinerator during periods of startup, shutdown, and malfunction. The OMP (40 CFR 63.1206 (c)(7)) describes procedures for operation, maintenance, inspection, and corrective measures for components of the incinerator. A Quality Control Program is required by 40

CFR 63.8 (c) and 40 CFR 63.1207 (e). The CMS PEP catalogues the quality assurance procedures for each of the measurement devices - the continuous monitoring systems (CMS)- that are used to monitor an operating parameter required by the rule. Quality assurance requirements for the CEMs that monitor the concentrations of CO and $O_2$ in the stack are also in the CMS PEP. This plan also meets the requirements of the Appendix to Subpart EEE for the CEMs. The FAP defines parameters and frequency for which the facility will analyze wastes to ensure compliance with the component feed rate limits of the rule. The FAP defines sampling parameters, methods, blending procedures, test methods, and frequencies. The HWC MACT requires that an operating training and certification program be developed and implemented by the compliance date. All applicable personnel operating the Calvert City plant incinerator have undergone training and are certified according to the requirements of 40 CFR 63.1206(c)(6). An operator training and certification program was developed, implemented, and completed. The performance test was completed in February 2002. The results from the test were used to establish the Operating Parameter Limits (OPL) for the incinerator. These OPLs entered into the Distributive Control System for the incinerator and Automatic Waste Feed Cut-offs (AWFCOs) have been established for each of these parameters.

The integrated RCRA trial burn/HWC MACT comprehensive performance test of the incinerator was completed in February 2002. The trial burn test included two test conditions. There were four test runs performed during each test condition. Test condition 1 was primarily designed to demonstrate destruction and removal efficiency of organic constituents of the waste feeds and to provide data on organic compound emissions for the site specific risk assessment, i.e., maximum waste feed rates, maximum combustion air flow rate, and minimum combustion temperature. Test condition 2 was primarily designed to demonstrate control of emissions of metals, ash, and $HCl/Cl_2$, i.e., maximum metals, ash, and $Cl_2$ feed rates, and maximum combustion temperature, and maximum combustion air flow rate.

The following table represents the operating parameter limits (OPLs) established for the incinerator. These OPLs have been entered into the unit distributive control system (DCS) and AWFCOs have been establishes for each of these parameters. The incinerator shall be operated in accordance with the operating parameter limits. Deviation from these parameters shall cause an immediate waste feed shut off.

| **Operating Parameter** | **Permitting Units** | **Established Operating Limits** |
|---|---|---|
| Maximum feedrate of mercury | 12-hour rolling average | 0.0031 lb/hr |
| Maximum ash feed rate | 12-hour rolling average | 21.92 lb/hr |
| Maximum feed rate of SVM (Pb, Cd) | 12-hour rolling average | 0.4836 lb/hr |
| Maximum feed rate of LVM (As, Be, Cr) | 12-hour rolling average | 0.2492 lb/hr |
| Maximum feed rate of total chlorine/chloride | 12-hour rolling average | 946.4 lb/hr |
| Minimum combustion chamber temperature (measured as flame temperature) | HRA | 2,022 °F |
| Maximum flue gas flow rate (measured as combustion air flow rate) | HRA | 1,341 scfm |
| Maximum pumpable hazardous waste feed rate | HRA | 1,801 lb/hr |

| Operating Parameter | Permitting Units | Established Operating Limits |
|---|---|---|
| Operation of waste firing system minimum atomizing steam pressure | HRA | 55 psig |
| Minimum pressure drop across the venturi scrubber | HRA | 41.3 inches of $H_2O$ |
| Minimum pressure drop across the primary packed scrubber | HRA | 0.20 inches of $H_2O$ |
| Minimum pressure drop across the secondary packed scrubber | HRA | 0.20 inches of $H_2O$ |
| Minimum liquid feed pressure to the primary packed scrubber | HRA | 5 psig |
| Minimum liquid feed pressure to the secondary packed scrubber | HRA | 0 psig |
| Minimum scrubber water flow rate to the venturi scrubber | HRA | 16.8 gpm |
| Minimum scrubber water flow rate for the primary packed scrubber | HRA | 29.8 gpm |
| Minimum scrubber water flow rate for the secondary packed scrubber | HRA | 19.5 gpm |
| Minimum pH on secondary packed scrubber | HRA | 8.0 |
| Emission limit for Carbon Monoxide | HRA | 100 ppmv corrected to 7% $O_2$ |

40 CFR 60 Subpart Cb, Emissions guidelines and compliance times for large municipal waste combustors that are constructed on or before September 20, 1994 (60.30b--60.39b) applies only to combustors that process greater than 250 tons per day municipal solid waste (MSW); the incinerator (A6) has a maximum capacity of under 22 tons per day and does not combust MSW, therefore, Subpart Cb is not applicable. 40 CFR 60 Subpart Ce, Emissions guidelines and compliance times for hospital/medical/infectious waste incinerators (60.30e--60.39e) applies only to "individual HMIWI for which construction was commenced on or before June 20, 1996." (60.32e(a)) The incinerator (A6) is not an HMIWI (hospital/medical/infectious waste incinerator) as it is defined in Subpart Ec (60.51c); therefore Subpart Ce is not applicable. 40 CFR 60 Subpart E, Standards of Performance for Incinerators. (60.50--60.54) applies only to incinerators that have a charging rate greater than 50 tons per day; the incinerator (A6) has a maximum charging rate less than 22 tons per day, therefore, Subpart E is not applicable. 40 CFR 60 Subpart Eb, large municipal waste combustors for which construction is commenced after September 20, 1994 (60.50b-60.59b) is not applicable in part because the incinerator (A6) was constructed prior to 1994 and does not combust MSW. 40 CFR 61 Subpart C, National Emission Standard for Beryllium (61.30--61.34), applies only to incinerators that process beryllium ore, beryllium, beryllium oxide, beryllium alloys, or beryllium-containing waste. The incinerator (A6) does not process any of the above materials; therefore, Subpart C is not applicable. 40 CFR 61 Subpart E, National Emission Standard for Mercury (61.50--61.56), applies to stationary sources that incinerate wastewater treatment plant sludge. The incinerator (A6) does not incinerate wastewater treatment plant sludge; therefore, Subpart E is not applicable. 401 KAR 59:021, New Municipal Solid Waste Incinerators, is not applicable to this emission point because the incinerator (A6) will not combust material, which if included in the waste stream, would be municipal solid waste (household and/or commercial solid

waste) per 401 KAR 59:021 Section 1(30). 401 KAR 59:023, New Medical Waste Incinerators, is not applicable to this emission point because it will not combust materials meeting the definition of "medical waste" per 401 KAR 59:023 Section 1(25). 401 KAR 59:020, Section 3(3), New Incinerators, Standards for Particulate Matter, is applicable to an affected facility of more than fifty (50) tons per day charging rate. The incinerator (A6) has a maximum daily charging rate less than 22 tons per day; therefore, this requirement is not applicable. 401 KAR 59:020, Section 4, New Incinerators, Monitoring of Operations, is applicable to an affected facility of more than fifty (50) tons per day charging rate. The incinerator (A6) has a maximum daily charging rate less than 22 tons per day; therefore, this requirement is not applicable. 40 CFR 60 Subpart VV does not apply since process unit does not produce as an intermediate or final product a chemical listed in 40 CFR 60.489.

**9. <u>Remediation</u>**

The soil bioventing system was installed in 1993. The soil bioventing system consists of a vent well equipped with a soil vapor-venting system. The vent well is located at the former UST excavation, which is estimated to be the center of the area of the impacted soil. Emissions from the system will consist of vent emissions from the soil-vapor venting unit and fugitive emissions from connectors and a sample port.

The remediation system was originally permitted by permit F-00-030. The permit authorized the construction and operation of soil and groundwater remediation systems, to be controlled by a new vapor treatment system (package thermal oxidizer and scrubber). Because emissions are instead controlled by the existing F-134a thermal oxidizer, which has it's own control device operating limitations, the package thermal oxidizer system conditions from F-00-030 are not relevant, and are not included in this permit. Instead, the Remediation System (EP 101) contains the requirement to vent emissions to the thermal oxidizer (EP Q5).

**MINOR PERMIT REVISION FOR additional mill powder line**

Arkema is adding a second air mill and associated milled powder line and replacing the existing air mill with a new one. The new and existing air mills and powder lines will be rated at approximately 1,500 lb/hr each, for a total milled powder production capacity of 3,000 lb/hr.

**MINOR PERMIT REVISION FOR monomer gas recovery vessel**

Arkema is clarifying the operation of the monomer gas recovery vessel to allow venting to thermal oxidizer or hazardous waste incinerator when maintenance is being performed on the polymer gasholder.

**MINOR PERMIT REVISION FOR polymer process alternate thickener**

Arkema is incorporating permanently the use of the polymer process alternate thickener.

**EMISSION AND OPERATING CAPS DESCRIPTION:**

**1. <u>Source wide Toxic Air Pollutants Emission Limits</u>**

401 KAR 63:020 Potentially Hazardous Matter or Toxic Substances applies to HF and Methyl Chloroform emissions. The source is in compliance with 401 KAR 63:020 based on the emission rates of toxics given in the application submitted by the source. If the source alters process rates, material formulations, or any other factor that would result in an increase of toxic emissions or the addition of toxic emissions not previously evaluated by the Division, the source is required to submit either modeling or other evaluation to show that the facility will remain in compliance with 401 KAR 63:020 along with the appropriate application forms required by 401 KAR 52:020, Section 3(1)(a).

401 KAR 63:021 requires that sources comply with permit conditions for toxic air pollutants in Title V permits, unless the source demonstrates that a condition is no longer necessary. The following table summarizes the most recent source-wide emission limits for chemicals listed in for former regulations 401 KAR 63:021 or 63:022 based on a review conducted of existing air permits:

| **Chemical** | **Existing source-wide emission limit (lb/hr)** | **Permit** |
|---|---|---|
| Calcium oxide | 0.51 | F-00-21 |
| Chlorine | 69.20 | F-00-21 |
| Hydrogen chloride | 29.70 | F-00-21 |
| Sodium hydroxide | 16.51 | F-00-21 |
| Trichloroethylene | 510.99 | F-00-21 |
| Antimony | 2.68 | F-00-21 |
| Potassium hydroxide | 2.76 | F-00-21 |
| Sulfuric acid | 2.08 | F-00-21 |

Calcium oxide and sulfuric acid emission sources are no longer in service. In order to demonstrate compliance, the maximum controlled source-wide emission rates should not exceed the limits.

**2. <u>Emission Factors and Emissions Calculations</u>**

Emissions are calculated from AP-42 emission factors, Engineering Estimates and Source tests.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.